

EdgeAccess® Universal Chassis System



**Model 6703
CWDM Transponder
User Manual**



CAUTION!

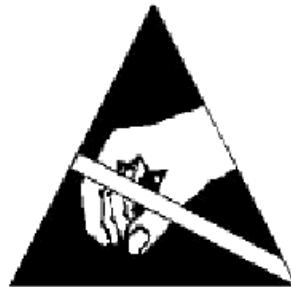
This product may contain a laser diode operating at a wavelength of 1300 nm - 1600 nm. Use of optical instruments (e.g., collimating optics) with this product may increase eye hazard. Use of controls or adjustments, or performing procedures other than those specified herein may result in hazardous radiation exposure.

Under normal conditions, the radiation levels emitted by this product are under Class 1 limits in 21 CFR Chapter 1, Subchapter J.

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Cet équipement peut avoir une diode laser émettant à des longueurs d'onde allant de 1300nm à 1600nm. L'utilisation d'instruments optiques (par exemple : un collimateur optique) avec cet équipement peut s'avérer dangereuse pour les yeux. Procéder à des contrôles, des ajustements ou toute procédure autre que celles décrites ci-après peut provoquer une exposition dangereuse à des radiations.

Sous des conditions normales, le niveau des radiations émises par cet équipement est en dessous des limites prescrites dans CFR21, chapitre 1, sous chapitre J.



NOTICE!

This device contains static sensitive components. It should be handled only with proper ElectroStatic Discharge (ESD) grounding procedures.

NOTE!

Cet équipement contient des composants sensibles aux décharges électro-statiques. Il doit absolument être manipulé en respectant les règles de mise à la terre afin de prévenir de telles décharges.

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EdgeAccess®
Universal Chassis System
Model 6703
CWDM Transponder
User Manual

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Chapter 1 Overview

The 6703 Coarse Wavelength Division Multiplexer (CWDM) Transponder converts optical signals from standard optical interfaces to Single mode CWDM wavelengths for use with a CWDM Multiplexer/Demultiplexer (Mux/Demux). The 6703 is protocol transparent and uses Avalanche Photo Diodes and Clock Data Recovery (CDR) to increase receiver sensitivity at high data rates.

The 6703 supports these options:

- Industry-standard and proprietary data rates from 100 Mbps to 2.5 Gbps
- Small Form Pluggable (SFP) transceivers, optional for Local port and standard for Remote port; order compatible, supported SFPs from Canoga Perkins
- Local and Remote optical port loopback
- Variable clock for data recovery; supports eight user-defined rates
- SpeedCop for monitoring received transmission rates

Connect the remote optical interfaces from five 6703 CWDM Transponders to one 6004 CWDM Passive Optical Mux/Demux to carry five full-duplex optical channels on one fiber pair. Similarly, connect nine 6703 Transponders to one 6008 CWDM Passive Optical Mux/Demux to carry nine channels on a fiber pair.

You can use the 6703 for these general applications; Figure 1:

- Wavelength Converter (transponder), which receives an optical signal at 850 or 1310 nm and converts it to a specific CWDM wavelength or standard 1310 nm high-power optics
- SpeedCop function, which monitors and assigns data rate limitations on the link
- 3R Repeater, which reshapes, retimes, and retransmits the optical signal

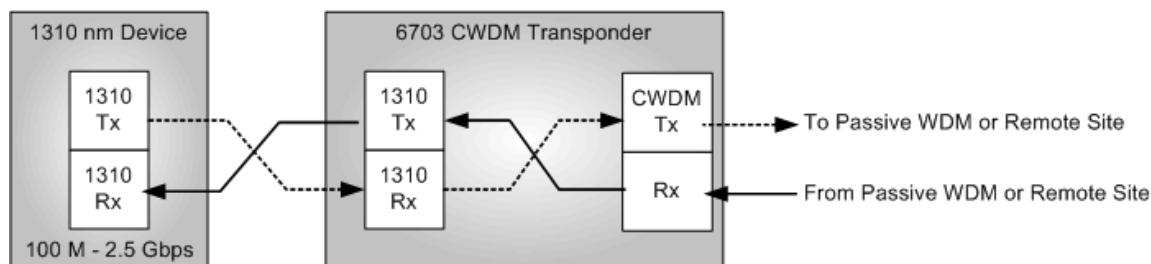


Figure 1. 6703 Wavelength Converter Function

You can use either of these methods to manage the 6703 through software:

- CanogaView® Network Management System (NMS), a management package with graphical user interface (GUI) that requires a network connection and can be opened through a web browser from a network terminal or through the internet
- VT100 Terminal Emulation through a Telnet session, HyperTerminal or similar terminal emulation software

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The 6703 front panel, shown in Figure 2, includes:

- Status LED
- Reset button
- TRM/MDM switch: Selects terminal emulation or a dial-up modem
- EIA-232 (Console) port with RJ-48 connector: Provides software management access
- Local port with Rx/Tx LEDs: Receives from/transmits to the local equipment; LEDs show port status; optical interface can be fixed SC at 1310 nm (6703-0003) or SFP (6703-0000)
- Remote port with Rx/Tx LEDs: Receives from/transmits to the 6004 or 6008 Passive Mux/Demux or remote site; LEDs show the transmitter and receiver status for the port; optical interface is always an SFP
- LCDR/SC and RCDR/SC LEDs: Show CDR and SpeedCop status for local and remote ports

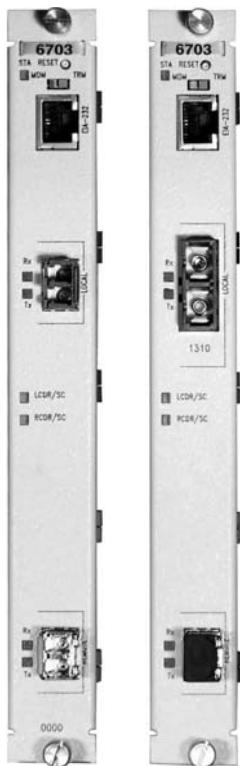


Figure 2. Front Panel, 6703 With Local Port Interface Options

Chapter 2

Hardware Installation and Operation

This section describes how to install a 6703 in a UCS 1000 or 1001 chassis or in a Model 1040 or 1050 standalone enclosure.

2.1 Install the Module

You can install the 6703 module in any slot from slot 1 to 15 in the UCS 1000, in either slot in a UCS 1001, or in a Model 1040 or 1050 standalone enclosure. To install the module, follow these steps:

1. Unpack and inspect all components. Save the shipping carton and packing materials in case you need to return any equipment; see Appendix A for information about returning equipment.
2. Insert the module in the selected slot, pushing it firmly into the backplane connector. Do not force it.
3. Hand-tighten the captive screws to secure the module in the chassis.

Note: The 6703 module is hot-swappable and can be inserted or removed at any time without affecting other modules.

4. Plug the SFP(s) into the port(s); the slot is keyed. To remove an SFP, either lift the bail or press the button on the SFP, then gently pull it out.

Dirty optical connectors are a common cause of link loss or attenuation problems, especially for single mode fiber (SMF). Clean the connectors before plugging in a cable and whenever there is a significant or unexplained light loss. To prevent contamination, always install protective dust covers on unused fiber optic connectors.

5. Wipe the ferrule and the end-face surface of the male fiber coupler with a lint-free, isopropyl alcohol pad from a fiber cleaning kit.
6. Use canned air to blow any dust out of the female fiber coupler.

Caution: To avoid damaging the fiber end-surface or connector, use extreme care when installing or removing cables.

7. Plug in the optical cables with Local to Local and Remote to Remote orientation. The remote device can be either a CWDM Mux/Demux or a remotely located 6703. See Figures 1 and 2.
 - For an SFP, push the cable in until it clicks. To unplug the cable, push the button on the side of the cable and gently pull.
 - If you have a duplex connector, use Tx to Rx, and Rx to Tx orientation.

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8. If you will directly manage the 6703, such as in a UCS 1001 or 1050 standalone enclosure, follow these steps:
 - a. Plug the RJ-48 serial cable into the console port on the front of the 6703.
 - b. Plug the other end of the serial cable into an RJ-48 to DE-9 adapter, then into the modem or the COM port on the PC.
 - c. Set the TRM/MDM switch to TRM for local management through a local terminal or to MDM for remote management through a dial-up modem.
9. For ease of maintenance, label each cable and connector with the signal name and direction.

2.2 Front Panel LEDs

The front panel includes LEDs that show general status for the 6703 and specific status for each Rx and Tx port. See Table 1.

Table 1. 6703 LEDs

LED	Status	Indicates
Status	Off	No power
	Green	Normal operation
	Amber	Power-on process
	Blinking amber	Running Bootcode during power-on
	Red	Hardware failure
Local Rx	Green	Received signal is above threshold (normal operation)
	Red	Received signal is below threshold
Local Tx	Off	Disabled
	Green	Enabled
	Blinking amber	Local Rx and Tx are in loopback mode
Remote Rx	Green	Port is active and received signal is above threshold (normal operation)
	Amber	Port is inactive and received signal is above threshold (secondary port)
	Red	Received signal on port is below threshold
	Blinking red	SFP not certified by Canoga Perkins
Remote Tx	Off	Disabled
	Green	Enabled
	Blinking amber	Remote Rx and Tx are in loopback mode
	Blinking red	SFP not certified by Canoga Perkins

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LED	Status	Indicates
LCDR/SC and RCDR/SC	Off	Clock Recovery and SpeedCop are disabled
	Green	Clock Recovery is enabled and locked and/or SpeedCop is enabled and within range
	Amber	Clock Recovery is disabled; SpeedCop detects a violation
	Red	Clock Recovery detects a loss of sync; SpeedCop is disabled
	Blinking green/amber	Clock Recovery is enabled and locked; SpeedCop detects a violation
	Blinking red/amber	Clock Recovery detects a loss of sync; SpeedCop detects a violation

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Chapter 3

Software Management

The standard management package is the VT100 Terminal Emulation, which you can access through a Telnet session, HyperTerminal or similar terminal emulation software, or CanogaView. You can run up to two management sessions at one time.

3.1 Use VT100 Terminal Emulation

You can access the VT100 terminal emulation management functions through the console port, a dial-up modem, or the Domain Management Module (DMM) for the domain. For details on the DMM, see the *Model 1500 Domain Management Module Users Manual*.

Note If the 6703 is in a UCS 1001, you cannot access it through a DMM because the UCS 1001 cannot host a DMM or Chassis Interconnect Module (CIM).

You must use a VT100 program through a serial connection for your first session. Canoga Perkins suggests that you use HyperTerminal. If you want to manage the 6703 through the Ethernet port on a 1040 enclosure, first set up the SNMP parameters; see Section 3.4.4.

These are general steps for the Windows interface; for details, see your Windows documentation.

1. Set the TRM/MDM switch on the 6703 front panel to TRM.
2. Turn on your PC.
3. When the Windows desktop appears, click Start, then highlight Programs, Accessories, the HyperTerminal Folder, and then click HyperTerminal.
4. At the Connection Description dialog, select an icon, enter a name for the connection to the system, and click OK.
5. At the Connect To dialog, pull down the Connect using menu, select the COM port, and click OK.
6. At the COM Properties dialog, on the Port Settings tab, set these values:
 - Bits per second: 19200
 - Data bits: 8
 - Parity: None
 - Stop bits: 1
 - Flow control: None
7. When HyperTerminal opens and is ready for login, press <Esc>. The Main Menu for the 6703 appears.

3.2 Management User Interface

The Management User Interface for the system provides screens for setup, monitoring, and diagnostics. These sections discuss the screens for the system, using a Telnet session for access.

3.2.1 General Screen Format

A typical 6703 screen includes standard screen descriptions and references. See Figure 3. All screens use a common method for navigation.

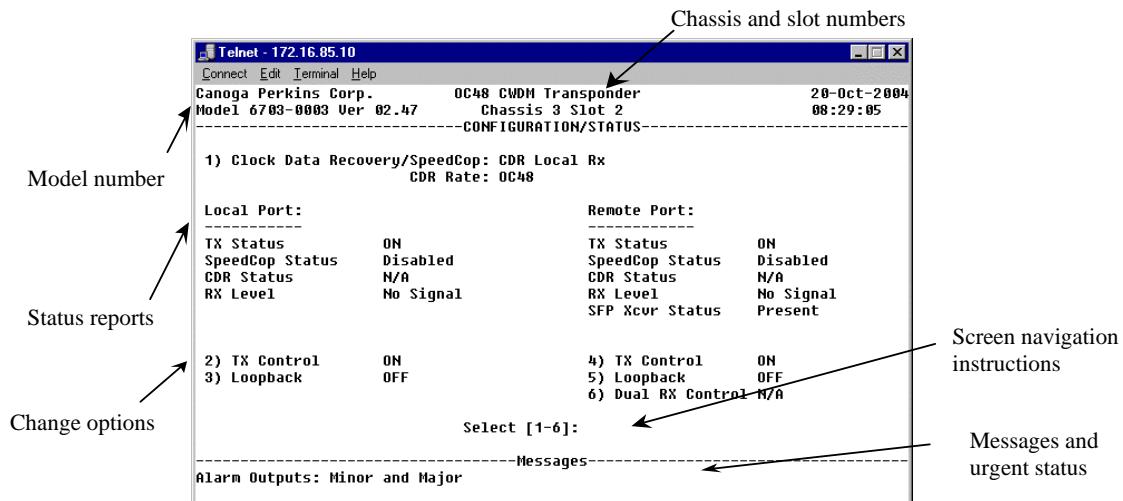


Figure 3. General Screen Navigation

Not all screens and menus provide options that you can modify. Some menu items reach screens that only report status, such as revision number, module type, or alarms. On other screens, you can select options and enter data.

Use these keys to navigate the screens:

- Spacebar When a menu item is highlighted, press <Space> to cycle through all options for that menu item.
- Tab Press <Tab> to move the highlight to the next column to the right.
- Enter Press <Enter> to select the highlighted option for a menu item.
- Escape Press <Esc> to return to the previous screen.

3.2.2 User Interface Organization

The user interface consists of selectable, nested screens, available in this order:

Main Menu

- 1) System Configuration
 - 1) Hardware Description/Interface Description
 - 2) Trap Configuration
 - 3) Alarm Output Configuration
 - 4) SNMP Configuration Parameters
 - 13) Host Table
- 2) Configuration/Status
 - 1) Clock Data Recovery/SpeedCop
- 3) Error Counters
- 4) Utilities
 - 6) PING Generation
- 5) Software Upgrade
- 6) Logout

This chapter describes each of these screens in detail.

3.3 Main Menu

The Main Menu provides access to all functions for the 6703: setup, diagnostics, and reports. See Figure 4.

```
MAIN MENU

1) System Configuration
2) Configuration/Status
3) Error Counters
4) Utilities
5) Software Upgrade
6) Logout
```

Figure 4. Main Menu

3.4 System Configuration Menu

The System Configuration menu provides access to most configuration options for the 6703. To access the System Configuration menu, follow these steps:

1. From the Main Menu, type 1, "System Configuration," and press <Enter>. The System Configuration menu appears.
2. To return to the Main menu, press <Esc>.

SYSTEM CONFIGURATION

- 1) Hardware Description
- 2) Trap Configuration
- 3) Alarm Output Configuration
- 4) SNMP configuration

Figure 5. System Configuration Menu

Table 2. System Configuration Option Definitions

Selection	Description
1) Hardware Description	Shows the model, type, revision and serial numbers; Alarm, power supply, and fan status; and interface types; no configurable options
2) Trap Configuration	Shows the trap configuration; you can enable/disable traps to the Network Manager
3) Alarm Output Configuration	Shows the alarm configuration; you can set each alarm parameter to Major, Minor or Off
4) SNMP Configuration	Shows the SNMP parameters if a Network Manager is in use; you can set options.

3.4.1 Hardware Description/Interface Description Screen

The Hardware Description screen shows the module type, with model and revision numbers, and the power supply status. The Interface Description screen shows parameters for both optical interfaces. Use this information when troubleshooting, such as tracking down an error in a data link or the configuration. To view the Hardware Configuration screen, follow these steps:

1. From the System Configuration menu, type 1, "Hardware Description," and press <Enter>. The Hardware Description report appears; see Figure 6.
2. To view the Interface Description report, press <Tab>; see Figure 7.
3. To return to the System Configuration menu, press <Esc>.

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HARDWARE DESCRIPTION

Chassis Type	5U UCS 1000
Chassis/Slot	5/4
Model	6703-0000
Type	UNIV OC48 TRANSPONDER SFP/SFP
Hardware Rev.	A1
Serial Number	20030485762
Power Supply Pri	DC Non Isolated
Power Supply Sec	AC 120/240
Fan Status	OK
Alarm Relay Inputs	N/A

Figure 6. Hardware Description Report

INTERFACE DESCRIPTION

Local	Remote
Type : SFP	Type : SFP
Part Number : SFP1-0055	Part Number : SFP2-5765
Wavelength : 850nm	Wavelength : 1570nm
Data Rate : 2500Mbps	Data Rate : 2500Mbps
Distance : 200m	Distance : 80 km

Figure 7. Interface Description Report

3.4.2 Trap Configuration

Traps are messages to alert network management about non-emergency conditions and events. Traps are logged, compiled, and saved for viewing, but are not sent to alarm relays for immediate notification. The DMM in the system logs the traps and transmits them by SNMP to the network manager. At the Trap Configuration screen, enable or disable traps individually or use the "Master Trap Control" to enable or disable all traps. See Figure 8. To configure traps, follow these steps:

1. From the System Configuration menu type 2, "Trap Configuration," and press <Enter>.
2. At the Trap Configuration menu, type the number for a trap and press <Enter>; for items 6, 7, and 8, press <Tab> to cycle between Local Port and Remote Port.

Note: "Master Trap Control" enables or disables all traps. The factory default is Disabled.

3. Press <Space> to cycle to Enabled or Disabled, then press <Enter>.
4. To return to the System Configuration menu, press <Esc>.

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TRAP CONFIGURATION

1) Master Trap Control	Enabled	
2) Diagnostics Trap	Enabled	
3) Cold Start Traps	Enabled	
4) Power/Fan Malfunction Traps	Enabled	
5) Alarm Input Traps	Enabled	
	Local Port	Remote Port
6) Receive Level Traps	Enabled	Enabled
7) SpeedCop Violation Traps	Enabled	Enabled
8) CDR Unlock Traps	Enabled	Enabled
9) SFP Transceiver Traps	N/A	Enabled

Figure 8. Trap Configuration Menu

3.4.3 Alarm Output Configuration

The alarms for the 6703 are output-only through a data bus to the rear panel on a UCS 1001 or 1040 standalone enclosure, or to the CIM in the same chassis, which routes any alarm to an external alarm. For details, see the *Model 1200 Chassis Interconnect Module User Manual*, *UCS 1001 Chassis User Manual*, or the *Model 1040 Standalone Enclosure User Manual*.

You can set each alarm condition to Major, Minor, or Off. To set the alarms, see Figure 9 and Table 3, and follow these steps:

1. From the System Configuration menu type 3, "Alarm Output Configuration," and press <Enter>. The Alarm Output Configuration screen appears.
2. Type the number for the alarm you want to set and press <Enter>; for items 4, 5, and 6, press <Tab> to cycle between Local, Remote Active, and Remote Inactive.
3. Press <Space> to cycle to Major, Minor, or Off, and press <Enter>.

ALARM OUTPUT CONFIGURATION

1) Factory Default			
2) Power Supply/Fan Alarm	Off		
3) Power On Self Test Alarm	Off		
	Local Port	Active	Remote Inactive
4) Receive Level Alarm	Minor	Major	N/A
5) SpeedCop Violation Alarm	Off	Off	
6) CDR Unlock Alarm	Off	Off	
7) SFP Transceiver Alarm	N/A	Minor	

Figure 9. Alarm Output Configuration Menu

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Table 3. Alarm Output Definitions

Alarm	Description
2) Power Supply/Fan	Power is low or fan is off; default is Minor
3) Power On Self Test	Module failed when power was turned on; default is Major
4) Receive Level	Receiver detects a low level or no light; default is Major
5) SpeedCop Violation	Data speeds are outside the currently set value; default is Minor
6) CDR Unlock	Clock Recovery is out of sync; default is Major
7) SFP Transceiver	SFP not certified by Canoga Perkins

3.4.4 SNMP Configuration

If you want to access the 6703 through a LAN connection to the 10BASE-T port on a 1040 enclosure, view and set up the SNMP parameters through the SNMP Configuration screen. See Figure 10 and Table 4. To view and set SNMP parameters, follow these steps:

1. From the System Configuration menu type 4, "SNMP Configuration," and press <Enter>. The SNMP Configuration screen appears.
2. Type the number for the parameter you want to set and press <Enter>.
3. Type the information or value, and press <Enter>.
4. To return to the System Configuration menu, press <Esc>.

```
SNMP CONFIGURATION PARAMETERS
Ethernet Address      00 40 2A 00 53 E7
Ethernet Link          UP/Half Duplex

1) System Contact
2) System Name
3) System Location
4) Read Community      public
5) Write Community     public
6) SLIP/PPP IP Address 192.0.0.90
7) Ethernet IP Address 172.16.143.10
8) Ethernet Subnet Mask 255.255.0.0
9) Ethernet Default Gateway 172.16.1.1
10) BOOTP Enabled       No
11) Serial Port Config   VT100
12) Telnet Timeout      Never
13) Host Table
```

Figure 10. SNMP Configuration Screen

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Table 4. SNMP Configuration Parameters Description

Item	Description
1) System Contact	Local information for the 6703, up to 50 characters in each field
2) System Name	
3) System Location	
4) Read Community	Name for the people who can view the reports, up to 10 characters; default is public
5) Write Community	Name for the people who can set values for parameters, up to 10 characters; default is public
6) SLIP/PPP IP Address	Enter the IP address for access through SLIP or PPP
7) Ethernet IP Address	Enter the IP address for access through the Ethernet network
8) Ethernet Subnet Mask	Enter the mask that sets the network ID part of the IP address
9) Ethernet Default Gateway	Enter the address of the network node that connects to another network
10) BOOTP Enabled	Enable this if the module needs to obtain its IP address from a BOOTP server; when the unit has an IP address, disable BOOTP
11) Serial Port Config	Set the type of serial port connection: VT100 (default), SLIP, or PPP
12) Telnet Timeout	Set the time with no activity until a Telnet connection automatically logs out
13) Host Table	Access the Host Table screen

3.4.5 Host Table

The SNMP agent allows access to up to 24 Host IP addresses listed in the Host Table. Set up the Host information for the 6703 on the Host Table screen. See Figure 11. To access the Host Table, follow these steps:

1. From the SNMP Configuration menu, type 13, "Host Table," and press <Enter>. The Host Table screen appears.
2. To add a host, type 1 and press <Enter>, then follow the prompts, to enter values for these parameters:
 - a. IP Address for the Host
 - b. Access level for the host; can be 1, read; 2, read/write; 3, read/trap; or 4, read/write/trap
 - c. Trap community string (up to 10 characters)
3. To delete a host, type 2 and press <Enter>, press <Space> to highlight the host address, and press <Enter>. The host table appears again with your changes.
4. To return to the SNMP Configuration menu, press <Esc>.

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HOST TABLE								
Managing Host	Access Level	Trap Community	Trap Port	Managing Host	Access Level	Trap Community	Trap Port	
172.16.142.20	4	public	162					
172.16.142.3	4	public	162					
192.0.0.3	4	public	162					

Add or Delete a host entry (1=Add, 2=Delete from table):

Figure 11. Host Table Screen

3.5 Configuration/Status Screen

The Configuration/Status report and menu provide information about the switches set in hardware, with options to set software control. To access the Configuration/Status screen, follow these steps:

1. From the Main Menu, type 2, "Configuration/Status," and press <Enter>. The Configuration/Status screen appears; see Figure 12 and Tables 5 and 6.
2. To set the CDR or SpeedCop option and rate, type 1 and press <Enter>. The Clock Data Recovery/SpeedCop screen appears; see Figure 13.
 - a. Type 1 and press <Space> to cycle through these options, then press <Enter>:
 - CDR Local RX: Checks and reclocks data rate on the Local Rx toward Remote Tx
 - CDR Remote Rx: Checks and reclocks data rate on the Remote Rx toward Local Tx
 - CDR Local & Remote Rx: Checks and reclocks data rate on both Local Rx and Remote Rx
 - SpeedCop Local Rx: Checks the maximum data rate on the Local Rx toward Remote Tx
 - SpeedCop Remote Rx: Checks the maximum data rate on the Remote Rx toward Local Tx
 - CDR & SpeedCop Local Rx: Checks the maximum data rate and reclocks the data rate on the Local Rx toward Remote Tx
 - CDR & SpeedCop Remote Rx: Checks and reclocks data rate on Remote Rx toward Local Tx
 - Disabled: Does not check data rate or reclock data
 - b. To select the data rate, type a number from 2 to 24, or type A to auto detect the rate, then press <Enter>. Standard data rates include those for Ethernet/SAN, SONET/SDH, and digital video. Use selections 2 through 9 to define up to eight data rates to reclock, in Mbps.
 - c. To return to the Configuration/Status screen, press <Esc>.
3. At the Configuration/Status screen, type the number for a control item and press <Enter>, then press <Space> to cycle through the options, and press <Enter> to select an option. See Table 6.
4. To return to the Main menu, press <Esc>.

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CONFIGURATION/STATUS

1) Clock Data Recovery/SpeedCop: CDR Local & Remote Rx
 CDR Rate: Auto Detect (1250 Mbps detected)

<u>Local Port:</u>		<u>Remote Port:</u>	
TX Status	ON	TX Status	ON
SpeedCop Status	Disabled	SpeedCop Status	Disabled
CDR Status	N/A	CDR Status	Locked
RX Level	OK	RX Level	-21.2 dBm (OK)
		SFP Xcvr Status	Present
2) TX Control	ON	4) TX Control	On
3) Loopback	OFF	5) Loopback	OFF
		6) Dual RX Control	N/A

Figure 12. Configuration/Status Screen

Table 5. Configuration Status Reports

Status Display	Function
TX Status	Shows transmission status for Local and Remote ports; normally On
SpeedCop Status	Shows one of these: Data Rate OK Speed within selected range Out of Range Speed out of range for user-defined or standard rate Disabled No SpeedCop mode selected N/A No SFP installed
CDR Status	Shows one of these: Locked CDR circuit is locked on selected rate Not Locked speed out of range for set rate (including Auto Detect) N/A No SFP installed or no CDR mode selected
RX Level	Shows one of these: Actual level, such as -21.2 dBm, for some SFPs OK Signal level within normal range No Signal Signal level too low or not present N/A No SFP installed
SFP Xcvr Status	Shows one of these: Present SFP installed Not Present SFP not installed Invalid SFP not certified by Canoga Perkins

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Table 6. Configuration Control Options

Control Option	Function
1) Clock Data Recovery/ SpeedCop Mode	Opens the Clock Data Recovery/SpeedCop screen to select CDR and/or SpeedCop option and rate; also shows current SpeedCop threshold or CDR rate; see Step 2 on page 3-9
2) TX Control (local) 4) TX Control (remote)	Set transmission for Local and Remote ports to one option (you cannot independently select redundant remote Tx ports, both ports work under a single control); default is On: On Always on, independent of quality of received signal Off Always off, independent of quality of received signal Off if Rx Low On unless received signal is below threshold
3) Loopback (local) 5) Loopback (remote)	Set loopback in software for Local ports and/or Remote ports; Loopback sends the Local Rx signal to the Local Tx port and/or the Remote Rx signal to the Remote Tx port; use for troubleshooting; when On, Loopback overrides current TX Control settings; default is Off: Local loopback, only, disables Remote Tx (due to invalid Tx signal) Remote loopback, only, disables Local Tx (due to invalid Tx signal) Both Local and Remote loopback enables both Local and Remote Tx
6) Dual Rx Control	Not used; always N/A

CLOCK DATA RECOVERY/SPEEDCOP

1) Clock Data Recovery/SpeedCop: CDR Local & Remote Rx
CDR Rate: Auto Detect (1250 Mbps detected)

User Defined Rates (Mbps):

2) 620.03	4) Available	6) Available	8) Available
3) Available	5) Available	7) Available	9) Available

ETHERNET/SAN:

10) Fast Ethernet (125 Mbps)	17) OC3/STM1 (155 Mbps)	21) 143 Mbps
11) Gigabit Ethernet (1250 Mbps)	18) OC12/STM4 (622 Mbps)	22) 177 Mbps
12) ESCON (200 Mbps)	19) OC24 (1244 Mbps)	23) 270 Mbps
13) 1G FICON (1063 Mbps)	20) OC48/STM16 (2488 Mbps)	24) 360 Mbps
14) 2G FICON (2125 Mbps)		
15) 1G Fibre Channel (1063 Mbps)		
16) 2G Fibre Channel (2125 Mbps)		

SONET/SDH:

Digital Video:

Figure 13. Clock Data Recovery/SpeedCop Screen

3.6 Error Counters

The Error Counters screen reports errors that occur on the 6703 link. See Figure 14 and Table 7. To view the link errors, follow these steps:

1. From the Main menu type 3, "Error Counters," and press <Enter>. The Error Counters screen appears.
2. To reset the timer and counters, press <Tab>.
3. To return to the Main Menu, press <Esc>.

ERROR COUNTERS			
Timer	Local	Remote Rx1	Remote Rx2
Receive Level	1	201	330
SpeedCop Violations	0	6	
CDR Unlock	0	0	

Figure 14. Error Counters Screen

Table 7. Link Error Counters Definitions

Item	Definition
Timer	Number of days, hours, minutes, and seconds since the last reset
Receive Level	Number of times the data level was too low to be detected
SpeedCop Violations	Number of times the data rate exceeded the selected rate
CDR Unlock	Number of times the data rate did not match the selected clock rate

3.6.1 Utilities Screen

Use the Utilities screen to set the time and date; change the password; set values for various parameters, including for communications; or to run the diagnostic PING. See Figure 15 and Table 8. To access the Utilities screen, follow this step:

1. From the Main Menu, type 4, "Utilities," and press <Enter>. The Utilities menu appears.

UTILITIES	
1) Set Date and Time	
2) New Password	
3) Modem/Slip/PPP Baud Rate	19200
4) Modem Initialization String	AT
5) Reset Configuration To Default	
6) PING Generation	

Figure 15. Utilities Screen

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Table 8. Utilities Menu Options

Item	Definition
1) Set Date and Time	Change the time and date information for the 6703 if needed; if in a chassis with a DMM, the DMM date and time overrides the 6703; if the 6703 loses power, it loses the Date and Time
2) New Password	Add, delete, or update the password for the user interface; type the new password, then confirm it at the prompt; after you log out, the new password will be required the next time a user tries to access the 6703 module
3) Modem/Slip/PPP Baud Rate	Set the baud rate, 9600, 19200, 38400, 57600, or 115200 bps for the modem/SLIP/PPP serial port
4) Modem Initialization String	The default string is "AT"
5) Reset Configuration To Default	Restores all configurable settings to the defaults except for: date and time; password; BOOTP; Telnet timeout
6) PING Generation	Access the PING diagnostics screen

3.7 PING

Use the PING Generation screen to test the connection to a specific IP address. See Figure 16.

```
PING Generation

IP Address to PING: 0.0.0.0
PING count (1 to 255, 0 = forever): 0
```

Figure 16. PING Generation Screen

To use the PING option, follow these steps:

1. From the Main Menu, type 4, "Utilities," and press <Enter>.
2. From the Utilities menu, type 6, "PING Generation," and press <Enter>.
3. At the prompt, type the IP address to PING and press <Tab>.
4. At the prompt, type the number of times to send a PING, from 1 to 256, or type 0 to PING continuously every 3 seconds, and press <Enter>. "PING response received..." indicates a good connection; "TIMEOUT: Unable to reach [IP address]..." indicates a faulty connection.
5. To stop the PING and return to the Utilities menu, press <Esc>.

3.8 Upgrading the Software

Each 6703 has two flash memory banks for storing firmware:

- Active Flash Memory holds the software in current use
- Inactive Flash Memory holds the software upgrade after downloading; can be swapped with the firmware in active memory

Use the Software Upgrade report and menu screen to check the current version of the firmware and upgrade it, if necessary. All 6703 modules within the system must run the same version of software. Check the readme file for the newer software to be sure that you need the upgrade.

Because downloading a software upgrade takes some time, the software is downloaded to the inactive memory to avoid disrupting service. Swapping the active and inactive memory banks automatically resets the module.

Note: The specific steps in this process vary, depending on the availability of a DMM to automatically upload software revisions to all modules directly from the software source.

If you manage your 6703 through a DMM, you can download the file from the Canoga Perkins website to your hard drive. Use the DMM to TFTP the file into the DMM library and, from there, to the 6703. For details, see the *Model 1500 Domain Management Module User Manual*.

3.8.1 Determine Current Software and Version

To determine the current software version used by the 6703, follow these steps:

1. At the Main Menu, type 5, "Software Upgrade," the Software Upgrade screen appears. See Figure 17.

SOFTWARE UPGRADE	
Active Firmware	01.68
Inactive Firmware	01.65
Bootcode	05.10
1 Software Reset	Reset
2 Swap Bank	Swap
3 Get New File with TFTP	
4 Copy Active bank to Inactive Bank	

Figure 17. Software Upgrade Screen

2. View and record the Active Firmware and Inactive Firmware versions. If the module has been updated, the Inactive and Active Firmware version numbers differ. The lower number, such as 1.33, is older than the higher number, such as 1.44. If the module has not been updated, the Active and Inactive Firmware version numbers are the same.

If a newer version of Firmware is available for the 6703, you can download it from the Canoga Perkins website or, if you cannot access the Internet, call Canoga Perkins at 818-718-6300.

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3. Log on to www.canoga.com and check that a newer version of the software is available.
4. Click Download.
5. Scroll to the listing for the 6703 software.
6. If this version is newer than your current version, click the file name to start the download process.
7. At the File Download window, select Save this Program to Disk.
8. At the Save As dialog, save the download to the root directory of your server.

3.8.2 Install the New Software Version

You can download the software revision to the DMM. For details, *Model 1500 Domain Management Module Uses Manual*.

To upgrade and install the new software version, activate the TCP/IP stack for the 6703 and follow these steps:

Caution: Do not update bootcode unless it is absolutely necessary. To avoid losing the bootcode during the download process, do not reset or power-down the module.

1. At the Software Upgrade screen, type 3, "Get New File with TFTP." The TFTP Software Upgrade Screen appears.
2. At the prompt, enter the TFTP Server IP Address. You can use the default IP address or enter a new host IP address and follow the prompts to save it as the new default.
3. Enter the filename. The last digits of the filename indicate the version number. For example, "67xx0173.zip" indicates firmware version 1.73 and "67xx0115.bin" indicates bootcode version 1.15.
4. Follow the prompts to download the file; "Download in progress, please wait" appears. When the download is complete, the new version is in the inactive flash memory. To use the new firmware, you must swap flash memory.
5. At the TFTP Operation screen, press <Enter> to return to the Software Upgrade screen.
6. At the Software Upgrade screen, type 2, "Swap Bank." The 6703 automatically resets, then goes online with the new firmware active. The inactive flash memory contains the old firmware. If a problem occurs with the new version, you can swap the old version back to active memory.

Other 6703 modules in the same domain can be simultaneously upgraded through the Virtual Group feature on the DMM. For details on using the Virtual Group, see the *Model 1500 Domain Management Module User Manual*.

3.9 SNMP - TCP/IP

You can use TCP/IP options such as TFTP, Telnet, PING and SNMP agents with the 6703 console port over SLIP or PPP. You must enable TCP/IP separately.

3.9.1 Set Up a Dial-up Connection

When the 6703 boots up, the serial port defaults to VT100 terminal mode for access. However, to use Telnet, TFTP or SNMP applications, you must switch the serial port to SLIP/PPP mode. To set up a Dial-Up Connection, follow these steps:

1. Set the MDM/TRM switch on the front panel to MDM.
2. Connect a straight-through cable between the serial port and the modem.
3. On your PC, launch Dial-up Networking. For details, see your Windows documentation.
4. Create a new dial-up entry in the Phonebook. Set up the protocol and specify the IP address for the computer. Set the serial port mode to match the protocol selected in the Dial-up Network setup on the PC.
5. Set the initialization string for the dial-up modem to include Hardware Flow Control and Data Compression Enabled, then select the modem, dial-up number and dial-up speed.
6. Set the dial-up speed on the PC to the speed selected for the modem. To check modem speed:
 - a. Set the MDM/TRM Switch on the front panel to TRM.
 - b. Reach the Main Menu and type 4, "Utilities."
 - c. At the Utilities screen, view the modem speed at item 3.

3.9.2 Create A Script to Configure the Serial Port

Because the DMM defaults to VT100 mode when booting, you cannot see the screens and commands used to switch to SLIP or PPP mode when you exit VT100 mode. Use a script file to successfully exit VT100 mode and switch to SLIP or PPP.

1. To create a script on your PC, open Notepad and type the steps you would follow to enter SLIP or PPP mode. On the last line, press <Space> once to select SLIP mode or twice for PPP mode

```
proc main

    waitfor "Password :"
    transmit $PASSWORD, raw
    transmit "^\r"

    transmit "1^\r"
    transmit "4^\r"
    transmit "11^\r"
    transmit " ^\r"

endproc
```

2. Save the Notepad document with a .SCP file extension in the folder where the Dialup Connection application looks for scripts. The script will be available in the Dialup script menu. This file is typically in the Windows\System32\ras\ folder.
3. To run the script, reach the Phonebook Entry dropdown menu and select either the PPP or the SLIP script.

3.9.3 Switch to PPP or SLIP Mode Without a Script

If you do not have a script file, and dial-up networking initializes a VT100 terminal screen, you will not see the screens, but the 6703 responds to the commands normally. Follow these steps:

1. After dialing, enter the password.
2. Type 1 to access the System Configuration screen.
3. Type 4 to access the SNMP Configuration screen.
4. Type 11 to highlight the Serial Port Configuration line.
5. Press <Space> once to select SLIP or twice to select PPP.
6. Press <Enter> to confirm the choice for port configuration.

You can now run TCP/IP applications.

3.10 The Canoga Perkins MIB

The Canoga Perkins private MIB provides fully managed access to configuration features, status reports and diagnostics. The private MIB is required for defining and indexing objects that will be recognized by the SNMP management system.

All major components of the modules monitored by the SNMP network are assigned index numbers, defined in a tree hierarchy. The index allows the SNMP manager to precisely identify each component (and other objects defined by the MIB file) when reporting module status.

You can download the private MIB, called "cp.mib," from the Canoga Perkins web site. This file must be compiled. The SNMP software on your system probably provides a feature to compile a MIB; for details, see the documentation for your PC.

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Chapter 4

6703 Specifications and Models

4.11 Specifications

Physical

Dimensions:	7.9" H x 1.0" W x 10.4" D (201 mm x 25 mm x 264 mm)
Weight:	0.92 lb (0.417 kg)
Operating Temperature:	0 to 50° C (32 to 122° F)
Operating Humidity:	Up to 95% (non-condensing)
MTBF:	6703-0000: 174,978 hours (30.2 years) 6703-0003: 219,713 hours (25 years)
Power Requirements:	9.5 W

Optical

Local Port, Fixed 1310 nm, Single Mode, SC	Tx output -3 to -10 dBm Rx range -3 to -18 dBm
SFP1-0055, 850 nm MM	Tx output -9.5 to -4 dBm Rx range -4 to -17 dBm at 1.25 Gbps
SFP1-2155, 1310 nm SM	Tx output -9.5 to -3 dBm Rx range 0 to -19 dBm at 1.25 Gbps
SFP1-2555, 1310 nm SM	Tx output -2 to +3 dBm Rx range -9 to -27 dBm at 2.5 Gbps
SFP2-xx65	Tx output 0 to +5 dBm Rx range -7 to -28 dBm at 2.5 Gbps

Regulatory Compliance

- ETL, cETL (UL 60950/CSA C22.2 No. 60950)
- EN 60950
- CDRH CFR21/EN 60825-1
- FCC Part 15B, Class A
- EN 55022
- EN 55024
- EN 61000-3-2
- EN 61000-3-3
- C-Tick (AS/NZS 3548)
- NEBS, Level 3
- CE Mark

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Table 9. EIA Interface Pinout

Signal	Pin	Switch at MDM	Switch at TRM
DCD	1	To module	From module
RXD	2	To module	From module
TXD	3	From module	To module
DTR	4	From module	To module
DSR	6	To module	From module
RTS	7	From module	To module
CTS	8	To module	From module
RI	9	To module	From module

4.12 6703 Models

Model	Description
6703-0000	Universal 6703 Transponder Base Unit, holds 2 SFPs
6703-0003	Local Tx/Rx 1310 nm SM, holds 1 CWDM SFP
Local Port SFPs	
SFP1-0055	SFP for Local Interface, 1062 Mbps - 2125 Mbps, 850 nm MM
SFP1-2155	SFP for Local Interface, 100 Mbps - 2500 Mbps, 1310 nm SM
Remote Port CWDM SFPs, 100-2500 Mbps	
SFP1-2555	1310 nm SFP, 100-2500 Mbps, 60 Km, LC
SFP2-4765	1470 nm SFP, 100-2500 Mbps, 80 Km, LC
SFP2-4965	1490 nm SFP, 100-2500 Mbps, 80 Km, LC
SFP2-5165	1510 nm SFP, 100-2500 Mbps, 80 Km, LC
SFP2-5365	1530 nm SFP, 100-2500 Mbps, 80 Km, LC
SFP2-5565	1550 nm SFP, 100-2500 Mbps, 80 Km, LC
SFP2-5765	1570 nm SFP, 100-2500 Mbps, 80 Km, LC
SFP2-5965	1590 nm SFP, 100-2500 Mbps, 80 Km, LC
SFP2-6165	1610 nm SFP, 100-2500 Mbps, 80 Km, LC

Appendix A

Warranty Information

Current Warranty information is available on-line in the Client Login Area of the Canoga Perkins web site (www.canoga.com) or by contacting Technical Support at 800-360-6642 (voice) or fiber@canoga.com (email).



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